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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/035,470	11/08/2001	Randy M. Arnott	1875.5910000	3980
7590	01/04/2005		EXAMINER	
Mr. Chris Franklin RAIDCore, Inc. Suite 304 71 Spit Brook Road Nashua, NH 03060			IQBAL, NADEEM	
			ART UNIT	PAPER NUMBER
			2114	
DATE MAILED: 01/04/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/035,470

Applicant(s)

ARNOTT ET AL.

Examiner

Nadeem Iqbal

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.



Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

NADEEM IQBAL
PRIMARY EXAMINER

Response to Amendment

This office action is in response to an amendment filed on Sep 20, 2004.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 & 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Menon (U.S. Patent number 5485571).

As per claim 1 & 10, Menon teaches (col. 4, lines 17-20) that the data regions, parity regions, and spare regions in a redundant array of storage units are distributed such that each storage unit in the array has the same number of parity regions before, during, and after a failure of one or more storage units. He thus teaches configuring the array with D disk drives of B physical blocks each. He also teaches allocating N user data and redundant data blocks to each disk drive, and allocating Free blocks since he teaches (col. 4, lines 40-44) organize storage units into data regions, a parity region, spare regions. He also teaches (col. 4, lines 58-60) that spare regions are assigned in blocks of $n \times (n+1)$ across the first $n+2$ storage units with rotation until spare regions have been assigned across the first $n+2$ storage units. He thus teaches limitations pertains to F free blocks as hot spare space to each disk drive, where $N+F \leq B$, and $(D-M) \times F \geq N$ to enable rebuilding of data and redundant blocks of failed disk drive in the free blocks of the remaining disk drives. He also teaches (col. 4, lines 25-28) that a distribution of data regions,

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parity regions, and spare regions in the single failure case can be easily applied recursively to manage multiple failures of storage units and ensure uniform workload distribution. He thus teaches limitations pertain to M concurrent disk drive failures. He further teaches (col. 4, lines 33-37) multiple failures of storage units in a redundant storage unit array can be managed such that the write workload is uniformly distributed among the storage units before and after one or more failures and also during the rebuild process itself. He thus teaches limitations pertain to rebuilding of data and redundant blocks of a failed disk drive in the free blocks of the remaining disk drives after M concurrent disk drive failures.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 2-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Menon (U.S.

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Patent number 5485571).

As per claims 2, 3, 6-9, Examiner has applied the rejection for these claims for the same reasons as set forth in the previous office action, mailed on May 19, 2004. Applicant should refer the previous office action since it is applied for this final rejection.

As per claims 4 & 5, He also teaches (col. 4, lines 25-28) that a distribution of data regions, and spare regions in the single failure case can be applied recursively to manage multiple failures of storage units and ensure uniform workload distribution. He also teaches (col. 10, lines 17-21) that if there is a failure, the controller CPU carries out the rebuilding process, directing XOR operations on data and parity regions and placing the resulting information in the appropriate spare regions. His rebuilding process would thus include generating new data and redundant data for concurrent disk drive failures of more than one disk drive.

Response to Arguments

1. Applicant's arguments filed May 19, 2004 have been fully considered but they are not persuasive. As per claims 1 and 10, Applicants alleges that Menon does not address the problem of concurrent failures of more than one disk drive and further that Menon does not teach or suggest a system that can handle concurrent failures. Examiner contends that Menon does teach and address the problem of concurrent failures of more than one disk drive, since he teaches (col. 4, lines 20-22) a failure of one or more storage units, and thus provides a uniform workload distribution among the storage units. He also teaches (col. 4, lines 25-28) that a distribution of data regions, parity regions, and spare regions in the single failure case can be easily applied recursively to manage multiple failures of storage units and ensure uniform workload

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distribution. He thus clearly addresses the problem of concurrent failures of more than one disk drive. He further teaches (col. 4, lines 33-37) multiple failures of storage units in a redundant storage unit array can be managed such that the write workload is uniformly distributed among the storage units before and after one or more failures and also during the rebuild process itself. He thus uniformly distributed the workload among the storage units before and after one or more failures and also during the rebuild process itself, therefore would not lose data as suggested by the applicants. As per claim 4, Applicants also alleges that the office action does not address the limitations pertain to generating new data and redundant data for concurrent disk drive failures of more than one disk drive. As stated per claims 1 & 10 above, Menon teaches that a distribution of data regions, parity regions, and spare regions in the single failure case can be easily applied recursively to manage multiple failures of storage units and ensure uniform workload distribution. He also teaches (col. 10, lines 17-21) that if there is a failure, the controller CPU carries out the rebuilding process, directing XOR operations on data and parity regions and placing the resulting information in the appropriate spare regions. His rebuilding process would thus include generating new data and redundant data for concurrent disk drive failures of more than one disk drive.

Conclusion

2. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO**


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MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nadeem Iqbal whose telephone number is (571)-272-3659. The examiner can normally be reached on M-F (8:00-5:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert W Beausoliel can be reached on (571)-272-3645. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).


Nadeem Iqbal
Primary Examiner
Art Unit 2114

NI